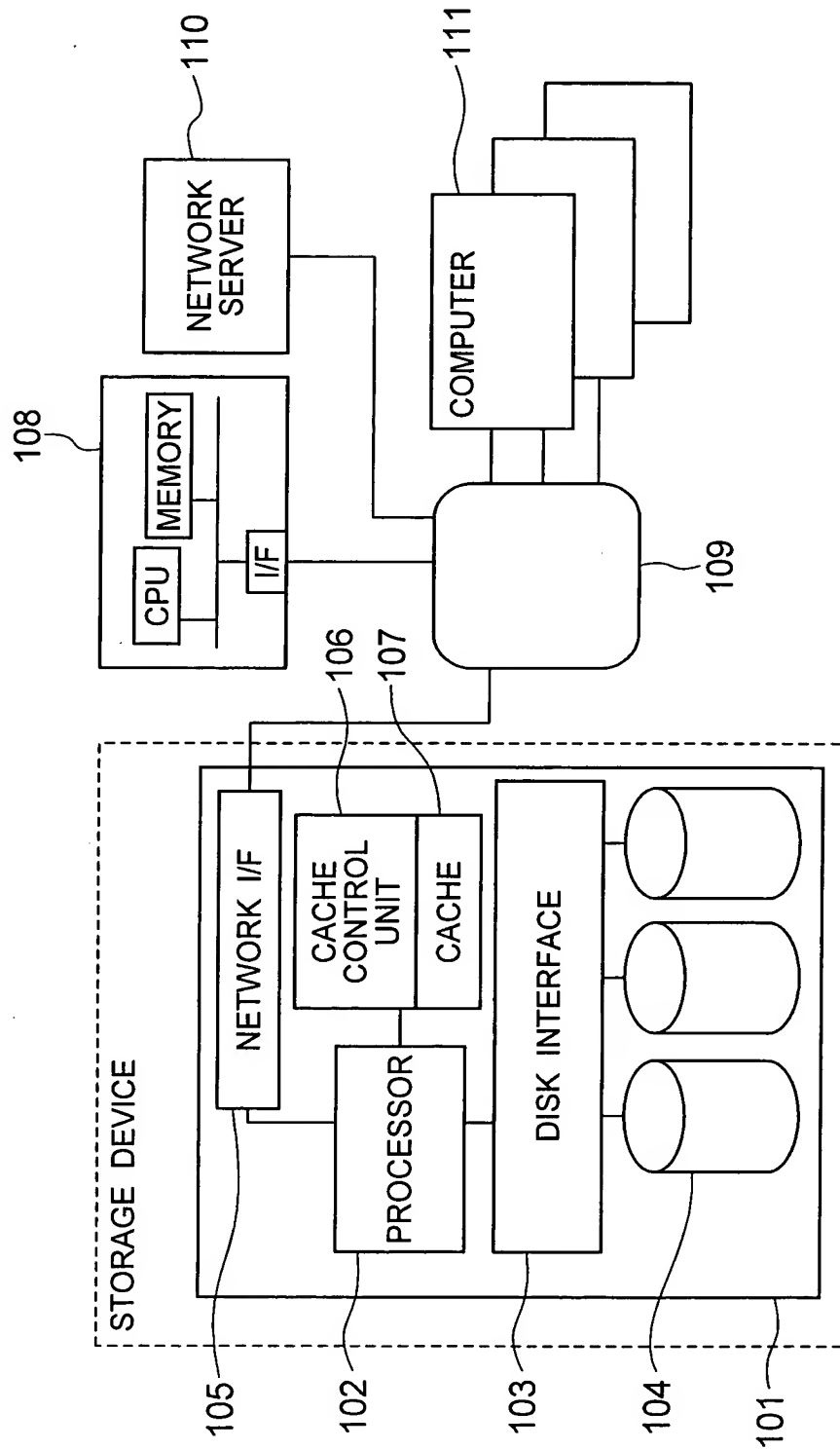Robert C. Colwell, Reg. No. 27,431   (650) 326-2400
Applicant: Satoshi OSHIMA, et al.
Title: Storage Device Having a Capability of Learning Access Patterns
Attorn y D cket No. 16869S-104700
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FIG. 1

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FIG. 2

COMPUTER ID	PHYSICAL NETWORK ID	HISTORY ID	HISTORY ID	• • •
1	192.168.0.10			
2	192.168.100.25			
3				

301

ACCESS LOCATION 5	ACCESS LOCATION 6	ACCESS LOCATION 7	ACCESS LOCATION 8	• • •

302

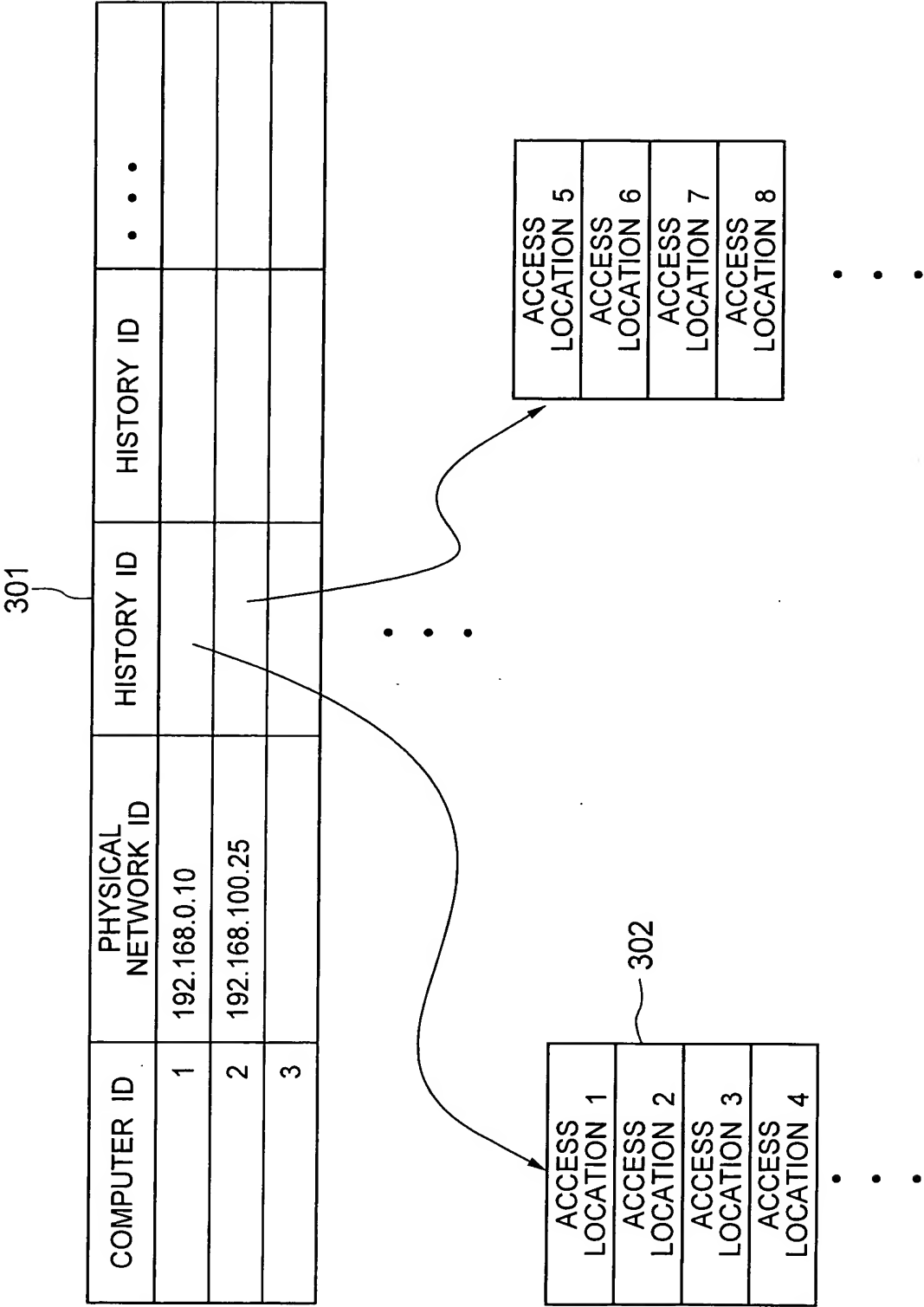| ACCESS LOCATION 1	ACCESS LOCATION 2	ACCESS LOCATION 3	ACCESS LOCATION 4	• • •

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FIG. 3

COMMAND	CONTENT OF PROCESS	ARGUMENT 1	ARGUMENT 2	ARGUMENT 3
StartRec	HISTORY COLLECTION START	COMPUTER ID	HISTORY ID	
EndRec	HISTORY COLLECTION STOP	COMPUTER ID	HISTORY ID	
TimeoutRec	HISTORY COLLECTION LIMITATION TIME	COMPUTER ID	HISTORY ID	HISTORY COLLECTION LIMITATION TIME
PointRec	HISTORY COLLECTION START CONDITION SETTING	COMPUTER ID	HISTORY ID	HISTORY COLLECTION START CONDITION
FlushRec	HISTORY DISCARD	HISTORY ID		
StartRead	READ-AHEAD START	HISTORY ID		
PointRead	READ-AHEAD START CONDITION SETTING	COMPUTER ID	HISTORY ID	READ-AHEAD START CONDITION
RegistID	PHYSICAL COMPUTER ID REGISTRATION	COMPUTER ID	PHYSICAL NETWORK ID	

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FIG. 4

WAITING —— 501

MANAGEMENT COMPUTER TRANSMITS A SIGNAL FOR STARTING A COMPUTER —— 502

START THE COMPUTER —— 503

COMPUTER OBTAINS A NETWORK ID FROM A NETWORK SERVER —— 504

MANAGEMENT COMPUTER OBTAINS A PHYSICAL NETWORK ID ALLOCATED TO THE COMPUTER FROM A NETWORK SERVER —— 505

MANAGEMENT COMPUTER REGISTERS THE PHYSICAL NETWORK ID WITH THE COMPUTER ID IN THE STORAGE DEVICE (RegistID) —— 506

MANAGEMENT COMPUTER DESIGNATES THE COMPUTER ID AND THE HISTORY ID TO THE STORAGE DEVICE AND INDICATES THE HISTORY COLLECTION START (StartRec) —— 507

508 — START HISTORY COLLECTION (StartRec)

MANAGEMENT COMPUTER COLLECTS ACCESS HISTORY —— 509

510 — IS THE LIMITATION TIME OF HISTORY COLLECTION EXCEEDED ? — YES

NO

511 — DOES MANAGEMENT COMPUTER SEND A HISTORY COLLECTION STOP COMMAND (EndRec) ? — YES

NO

514 — STOP HISTORY COLLECTION OF THE SPECIFIED COMPUTER ID

IS ALL HISTORY COLLECTIONS STOPPED ? — 512

NO

YES

WAITING —— 513

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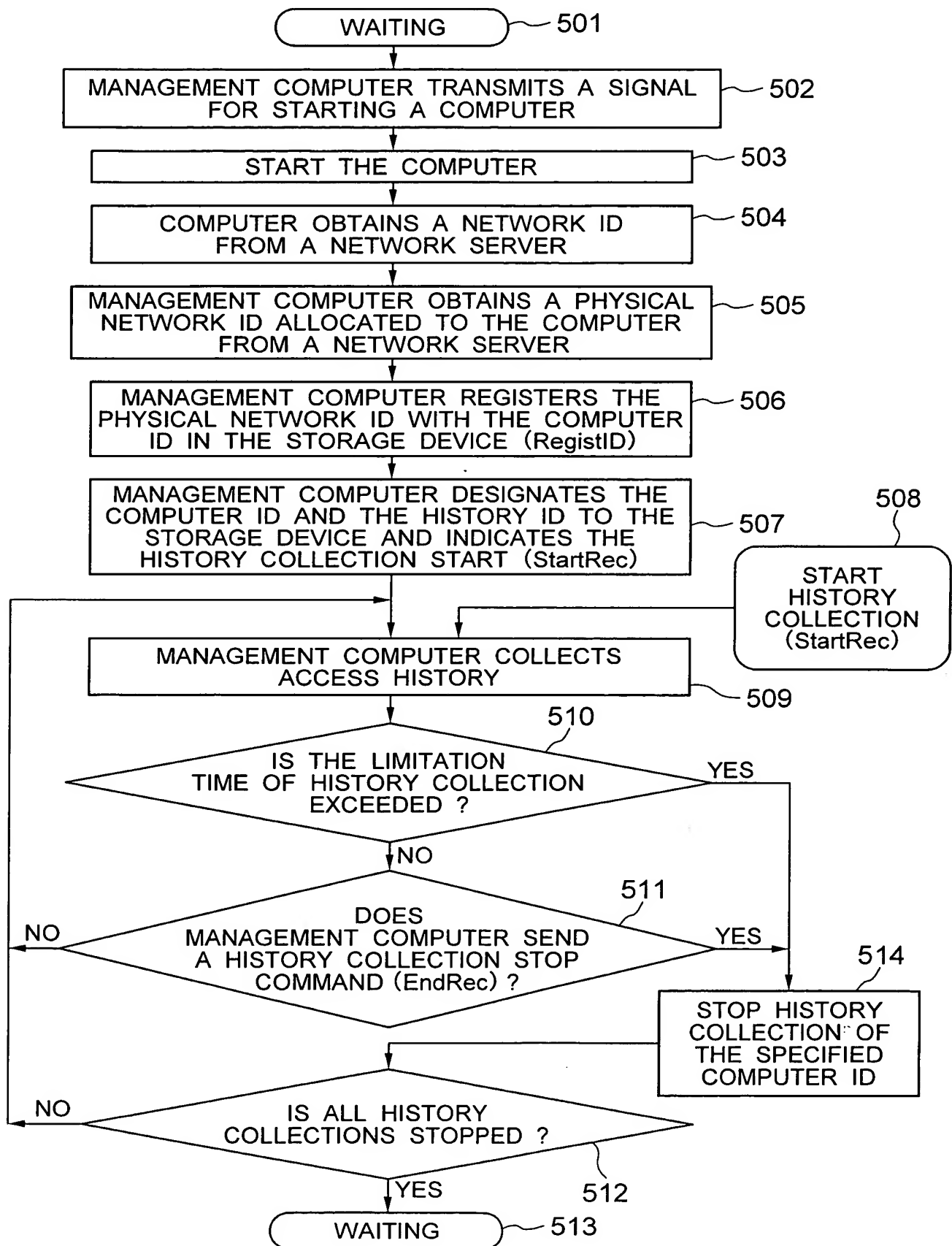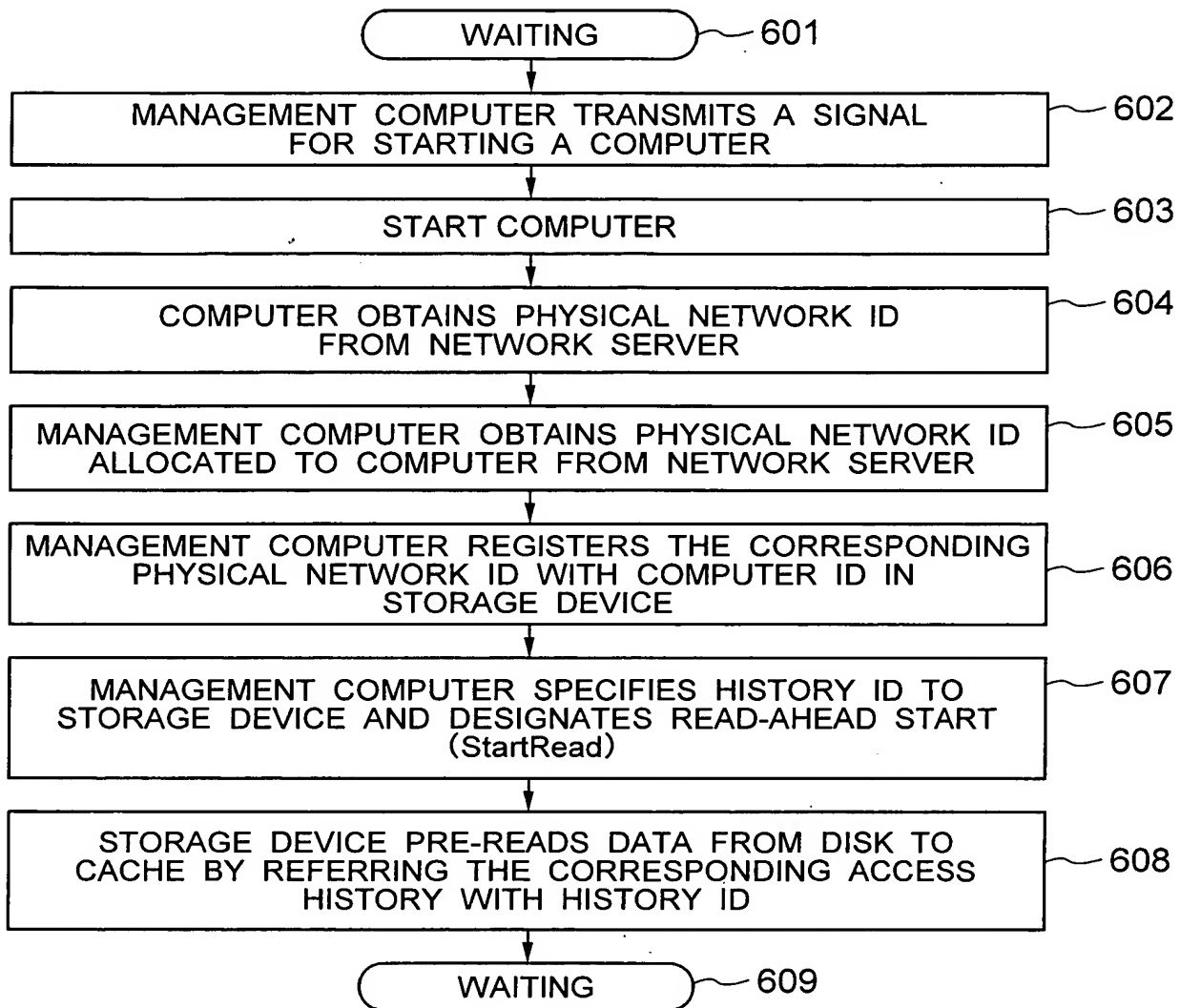**Attorn y Dock t No.** 16869S-104700
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FIG. 5

WAITING —— 601

⬇

MANAGEMENT COMPUTER TRANSMITS A SIGNAL FOR STARTING A COMPUTER —— 602

⬇

START COMPUTER —— 603

⬇

COMPUTER OBTAINS PHYSICAL NETWORK ID FROM NETWORK SERVER —— 604

⬇

MANAGEMENT COMPUTER OBTAINS PHYSICAL NETWORK ID ALLOCATED TO COMPUTER FROM NETWORK SERVER —— 605

⬇

MANAGEMENT COMPUTER REGISTERS THE CORRESPONDING PHYSICAL NETWORK ID WITH COMPUTER ID IN STORAGE DEVICE —— 606

⬇

MANAGEMENT COMPUTER SPECIFIES HISTORY ID TO STORAGE DEVICE AND DESIGNATES READ-AHEAD START (StartRead) —— 607

⬇

STORAGE DEVICE PRE-READS DATA FROM DISK TO CACHE BY REFERRING THE CORRESPONDING ACCESS HISTORY WITH HISTORY ID —— 608

⬇

WAITING —— 609

FIG. 6

TRANSMISSION DESTINATION PHYSICAL NETWORK ID	—— 701
TRANSMISSION SOURCE PHYSICAL NETWORK ID	—— 702
COMMAND	—— 703
ARGUMENT	—— 704

•

•

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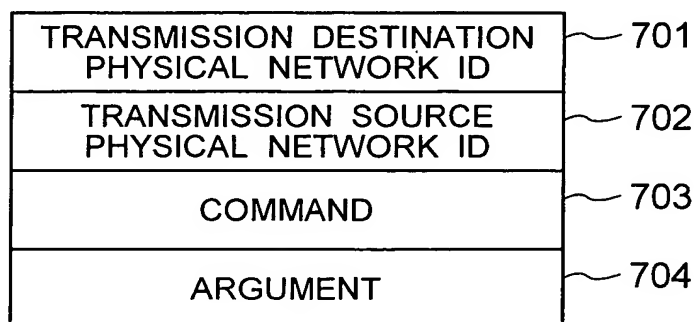Robert C. Colwell, Reg. No. 27,431   (650) 326-2400
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FIG. 7

COMPUTER GROUP ID	COMPUTER GROUP NAME	COMPUTER ID	COMPUTER NAME
1	GROUP 1	1	COMPUTER 1
		2	COMPUTER 2
2	GROUP 2	3	COMPUTER 3
		4	COMPUTER 4
		5	COMPUTER 5
3	GROUP 3	6	COMPUTER 6

FIG. 8

HISTORY ID	HISTORY NAME
1	WHEN COMPUTER 1 STARTS
2	WHEN COMPUTER 3 STARTS
3	WHEN COMPUTER 1AP1 STARTS

FIG. 9

JOB ID	COMPUTER GROUP ID	HISTORY ID	STARTING CONDITION	STAR TIME	YES OR NO OF COMPUTER START
1	1	1	TIME	9:00	YES (THREE MINUTES LATER)
2	2	2	MANUAL	-	YES (TEN MINUTES LATER)
3	1	3	TIME	10:00	NO

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FIG. 10

WAITING — 1101

↓

USER DESIGNATES JOB START TO HISTORY MANAGEMENT PROGRAM OR TIME REACHES JOB START TIME SPECIFIED AT START TIME — 1102

↓

OBTAIN JOB ID SPECIFIED TO START OR JOB ID WHOSE START TIME IS PASSED — 1103

↓

OBTAIN THE CORRESPONDING HISTORY ID WITH SPECIFIED JOB ID AND DESIGNATE STORAGE DEVICE TO EXECUTE READ-AHEAD OPERATION — 1104

↓

STORAGE DEVICE PRE-READ DATA FROM DISK TO CACHE BY REFERRING TO THE CORRESPONDING ACCESS HISTORY WITH HISTORY ID — 1105

↓

HISTORY MANAGEMENT PROGRAM TRANSMITS START SIGNAL TO COMPUTER BELONGING TO COMPUTER GROUP SPECIFIED BY COMPUTER GROUP ID A TIME SPECIFIED BY THE ABSENCE OR PRESENCE OF COMPUTER START LATER — 1106

↓

WAITING — 1107